

CHARACTERIZATION OF NATIVE SLOVAK CHICKEN AND GOOSE: A REVIEW

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ABSTRACT

Nowadays, there are four local poultry breeds originating from different parts of Slovakia. At present time, there are registered low numbers of native breeds of poultry on the territory of Slovakia. In the last century, four poultry breeds were created - chickens (Oravka, Bantam Oravka) and goose (Suchovska goose and Slovak goose). In this article we collected and analyzed the data about the origin, breed characteristics and population size of native poultry breeds.

Key words: chicken; goose; Oravka breed; Slovak goose; Suchovska goose

INTRODUCTION

The current economic situation causes an interest in specialized poultry lines in advanced countries in the world, focusing on egg-laying or meat-based performance. Due to the very intense breeding, many genes are lost and they may be missing in future. Therefore, the reasons for keeping poultry genetic resources are the same as for all species of farm animals. Characteristics of poultry genetic resources include the collection of population size data, its structure and geographic spread, the production systems in which the breed is involved, its phenotypic attributes as well as the historical development of the breed (crossing, selection). These data should be available at standardizing the breeds and experimental lines. However, it is difficult to get the data from either commercial line breeders or small farmers. Molecular markers, which also contribute to the identification of the breed's identity, can provide important information on genetic variability either within or among populations. Current data provide a fairly comprehensive picture of genetic variability and population structure

in domestic poultry breeds. In the last century four poultry breeds were bred in Slovakia – Oravka and Bantam Oravka chickens, Suchovska goose and Slovak goose.

CHICKEN

The domestic chicken is descended primarily from the red jungle fowl (*Gallus gallus*) and is scientifically classified as the same species. As such it can and does freely interbreed with populations of red jungle fowl (Wong *et al.*, 2004). Recent genetic analysis has revealed that at least the gene for yellow skin was incorporated into domestic birds through hybridization with the grey jungle fowl (*G. sonneratii*) (Eriksson *et al.*, 2008). The traditional poultry farming view is that chickens were first domesticated for cockfighting in Asia, Africa and Europe, rather than for egg or meat production. In the last decade there have been a number of genetic studies to clarify the origins. According to one study, a single domestication event occurring in the region of modern Thailand created the modern chicken

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with minor transitions separating the modern breeds (Fumihito *et al.*, 1994).

ORAVKA CHICKEN

Oravka chicken is a dual purpose breed. It is of Slovakia provenience and is classified as a Slovak native breeds.

Development

The development of Oravka chicken started in 1950s under the guidance of Ing. V. Babushkin at the Research Institute for Poultry by combinatorial crossing of regional breeds with breeds of Rhode Island Red, New Hampshire and Wyandotte White (Chmelničná, 2004). The goal was to develop a breed suitable for harsh climatic conditions of northern Slovakia which can be kept in free range. It was adapted for egg and meat production. In 1990 the yellow-brownish Oravka and in 2008 white Oravka were recognized as an independent Slovak national breeds.

Bantam Oravka breed was developed in the 1980s as the result of crossbreeding of Oravka with Bantam Dresdner and Bantam Sumavanka. Bantam Oravka should follow the large fowl standard in all respects, however, the feathering color is more intense compared with large Oravka. Recently Bantam Oravka is keeping only in original yellow-brownish colour.

Characteristics

The yellow brownish Oravka chicken according to breed standard has hard rectangular frame, comb is rosette; medium size; the mandrel follows the header line; legs are medium length; without feather; yellow; red tinted strip (lampas) on the sides of the bows is wanted; fingers are straight; well stretched; feather is rich; well-fitting; solid structure. Body weight of males is between 2.8 and 3.3 kg, body weight of females is between 2.2 and 2.7 kg, egg laying ranges from

180 to 200 pcs per year; eggs are of a brownish shell, their average weight is about 55 g.

Weight of Bantam Oravka cock is from 1.0 to 1.3 kg, hens from 0.9 to 1.1 kg. Egg yield is 140 eggs with a brownish shell, the minimum hatching egg weight is 40 g.

The National Agriculture and Food Centre – Research Institute for Animal Production (NPPC – RIAP) Nitra, Department of Small Farm Animals kept the conservation flock of yellow brownish Oravka chicken. The laboratory of the Department of Genetics and Reproduction of NPPC – RIAP Nitra is focused on the isolation, culture and cryopreservation of blastodermal and primordial germ cells in chicken. The quality of blastodermal and primordial germ cells before and after cryopreservation is evaluated by fluorescent microscopy, flow cytometry and transmission electron microscopy. We also cryopreserve rooster semen of endangered Oravka breed and assess their quality by methods mentioned above. Semen samples of individual roosters (n = 6) are stored in the gene bank at NPPC – RIAP Nitra.

Table 1 shows the basic growth characteristics of three lines of Oravka, while the table 2 shows numbers of laid eggs in these lines. Hatchability from fertilized eggs of Oravka breed in NPPC – RIAP Nitra was higher than 83 % (Hanusová *et al.*, 2016).

Current status

The number of breeds of both forms of Oravka in Slovakia was counted by Hrnčár and Weis (2007). The development of breeds in 2007-2008, controlled by the Slovak Breeder Association, was monitored by Oravcová *et al.* (2010). In Slovakia in 2008, ten controlled flocks of Bantam Oravka with 11 males and 61 females were registered. Ten controlled flocks of Bantam Oravka with 11 males and 61 females were registered in Slovakia in 2008. Peak in frequency of Bantam Oravka controlled flocks was noted in 2005. In years 2006-2008 a tendency of decrease in the number of controlled flocks

Table 1: Live weight of Oravka chickens at NPPC – RIAP Nitra by sex

Line	5 weeks old (g)				12 weeks old (g)				20 weeks old (g)			
	♀		♂		♀		♂		♀		♂	
	n	$\bar{x} \pm SD$	n	$\bar{x} \pm SD$	n	$\bar{x} \pm SD$	n	$\bar{x} \pm SD$	n	$\bar{x} \pm SD$	n	$\bar{x} \pm SD$
OR1	75	573.1 ± 62.2	64	645.3 ± 68.4	71	1052.0 ± 149.1	59	1295.4 ± 208.1	30	2020.0 ± 281.0	15	2337.3 ± 201.0
OR2	60	548.3 ± 75.1	81	608.6 ± 61.1	57	1044.0 ± 179.0	77	1251.4 ± 183.2	33	1955.5 ± 251.0	25	2226.9 ± 287.2
OR3	79	527.7 ± 58.3	61	624.4 ± 78.7	76	1054.6 ± 121.1	58	1364.8 ± 169.9	47	1996.4 ± 138.3	24	2335.8 ± 260.5

Table 2: Number of laid eggs of Oravka chickens at NPPC – RIAP Nitra

Traits	OR1	OR2	OR3
Number of days	260	260	260
Number of eggs	1948	2206	2106
Average laying (pcs)	146.08	157.60	161.98
Laying intensity (%)	60.00	60.90	62.62

of this hen’s breed was observed (Weis and Hrnčár, 2007). At present, there are 20 registered breeding farms of Oravka and 7 registered breeding farms of Bantam Oravka in Slovakia.

GOOSE

Geese are one of the oldest species of domestic poultry. There are 181 recognized breeds of domestic goose in the world with 158 local populations distributed mainly in Europe and Asia (Mindek *et al.*, 2014). Native goose breeds have better adaptability to extensive management, better disease resistance, higher reproduction rates and better meat quality, which are based on the natural gene pool and good original material of crossbreed predominance and high performance. Such excellent native breeds may contain the gene and alleles permanent to the adaptation to particular environments and local breeding goals and needed to maintain genetic resources permitting adaptation to unforeseen breeding requirements in the future and a source of research materials (Hrnčár *et al.*, 2012, Romanov *et al.*, 1996).

SLOVAK GOOSE

Slovak white goose is also known as the Slovak goose of the Danube area. It belongs to moderate breeds of a solid constitution. It is characterized by a compact, slightly sloping body holding and a noble look.

The Suchovska and Slovak goose were categorized as endangered breeds (Weis *et al.*, 2010).

Development

Slovak goose was established in 1940s on the basis of regional breeds from South-Eastern part of Slovakia (from Nitra and Levice areas). The aim of breeding was to create a medium weight triple purpose (meat, liver, feather) goose suitable for corn areas, a strong resistant goose with a good pasturing ability and with preserved clucking instinct. The interest in this type breed was renewed upon the initiative of the Slovak Union of Breeders in the 1960s (Weis and Hrnčár, 2007). The first framework standard of the Slovak goose was published by Malík (1966). Literary sources do not indicate the year of recognition and initial number of birds because the Slovak goose is a native Slovak breed, it was not necessary to recognize it as a breed (Kadlečík *et al.*, 2004).

Characteristics

Slovak goose is middle-heavy breed of goose noble appearance and firm constitution. It uses very good pasture and has preserved quiltiness. By the first year of breeding, male reaches the weight of 7 kg, the goose female after the end of the first fertilization cycle reaches weight of 6 kg. Laying is 12 and more eggs with white egg shell. Hatching eggs weight 140 g. Feather is pure white, of medium quality. The volume fraction of the punch exceeds the volume of the cover feather. It is hardy, good for grazing. It has a preserved quandary instinct that is itself hatch and inferred by the young.

Table 3: Genetic diversity of the Slovak goose

Group of breeds	Sample size	Mean no. of allele	Mean no. of effect. allele	No of private allele	Mean expect. heterozyg.	Mean observed heterozyg.	LD
Suchovska	32	4.00	2.01	9/7	0.38	0.33	7
Slovak	18	3.67	2.16	7/3	0.45	0.39	3
Total	50	5.17	2.09	16/10	0.43	0.56	6

It has a good disposition for cooking and creating delicious livers. The risk factor is a low number of controlled flocks and this creates more pressure on the breeders and judges at the specialized exhibitions and the recognition of breeding flocks. A high risk for the reproduction is a tendency of gander, male goose, to be monogamic and the mutual refusal, which exist in both sexes (Kadlečík *et al.*, 2004).

Current status

The lowest population of Slovak goose was in 2001 (34 birds: 10 males and 24 females), the highest in 2005 (83 birds: 24 males and 59 females). The effective population size of Slovak goose varied widely from 28.235 (in 2001) to 76.861 (in 2008) with an average of 56.261. At present there are 6 registered breeding farms of Slovak goose in Slovakia.

SUCHOVSKA GOOSE

The goose is suitable for pasture and also for small farming, because of the preservation of the clucking instinct of the goose. The risk factor is that this goose is bred in a small breeding area.

Development

The Suchovska goose is a result of crossbreeding of local yellow fathering goose with French (Toulouse, Landes) and German (Pomorany, Steinbach) goose. This breed of goose originated at the end of the 1980's in the village of Suchá nad Parnou, and was recognized as a breed in 1995 with a number of 45 birds: 21 males and 24 females (Kadlečík *et al.*, 2004, Hrnčár *et al.*, 2008). It was created seeking to breed goose of bigger body frame, firm constitution and of compact and solid body.

Characteristics

The Suchovska goose has bigger and hard body frame. The body is long, compact, muscled, firm, almost horizontally held, body width is equal to its height. The neck is medium long and coarser. Breasts are full, broad, well rounded. Body is deeper and a double-lobed. The goose is saddling and pasture type. Body weight of males is between 6.5 and 7.5 kg, body weight of females is between 5.5 and 6.5 kg, egg laying ranges from 14 to 16 egg. Color of egg shell is white. Hatching eggs weight 140 g. Feather is smoother, with more dust. Color is yellow-wild. Female is similarly colored as a male with a larger amount of gray admixture, overall appears darker.

The characterization of the genetic diversity and structure of both native Slovak goose breeds was based on six microsatellite loci analysis in a total population

of 50 birds (Mindek *et al.*, 2014). The results are given in Table 3.

Current status

The lowest population of Suchovska goose occurred in 2003 (67 birds: 26 males and 41 females) and the highest in 2005 (143 birds: 43 males and 100 females). Minimal detected effective population size of the Suchovska goose was 57.778 (year 2001), the maximum being 125.333 (year 2006) with an average of the 96.717 (Weis *et al.*, 2010). At present there are 7 registered breeding farms of Suchovska goose in Slovakia.

CONCLUSION

The Oravka and Bantam Oravka chickens, Slovak and Suchovska goose are among the native Slovak breeds, reared especially under conditions that are natural for the species. They have good welfare, the possibility for pasture, moreover, goose also has access to water. Animals are fed healthily, they have food without the addition of chemical preparations, medicines and antibiotics. The products of such animal (meat and eggs) are healthy. At present, with the growing demand for poultry products from extensive systems, it is important to raise native chicken breeds suitable for free-range and organic farming because of their good adaptation to the local conditions. This is confirmed by the experience of many countries, where native breeds of slow-growing chickens provide good-quality meat. Native poultry breeds play an important social role among farmers and have a positive impact on maintaining rural society and traditional form of agriculture as well as gratify local traditions. They represent a gene source for future breeding strategies and research. An alternative native breeds in poultry production system have an important advantage of biodiversity and sustainable agricultural production.

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